

Incoming
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cc: Leslie
Paul

Comments from Jennifer P. Spinti, Institute for Clean & Secure Energy, University of Utah
on the

NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

Red Leaf Resources, Inc.

Seep Ridge Block: Southwest #1 Mine

Div. of Oil, Gas & Mining

NOV 21 2011

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Red Leaf Resources, Inc., has submitted an application to the Utah Division of Oil, Gas, and Mining (DOGM) to convert its current Small Mining Operation permit to a Large Mining Operation (LMO) permit on two of its SITLA Mineral Leases. By Utah law, a large mine is any mining operation that results in more than five acres of surface disturbance. Any entity wishing to operate a large mine must submit a Notice of Intention (NOI) to Commence Large Mining Operations as per Rule 647.4. The NOI is submitted to the Minerals Regulatory Program (MRP) within DOGM. The NOI must include all required information and be filed with and approved by DOGM.

To put the Red Leaf application in perspective, there are approximately 115 active LMOs in the state of Utah permitted by the MRP. This total does not include any active coal mines, which are not regulated under the MRP. Materials being extracted from these mines include copper, silver, gold, iron, uranium, clay, gypsum, travertine, salt, rock aggregate, landscape rock, sandstone, silica, phosphate, gilsonite, oil shale, and tar sands.

One of the largest LMOs in Utah is the Kennecott Copper Mine. The mine, in production since 1906, has a diameter of 2.75 miles and a depth of 0.75 mile. It covers a surface area of 1,900 acres. Red Leaf's application lists 1,477 acres as the total surface acreage to be disturbed out of a project area of 1,604 acres. Although the total depth of the proposed mine is not explicitly stated, I estimate its maximum depth to be 350 feet (0.066 mile) based on information in the NOI. A major difference between Kennecott and the proposed Red Leaf mine is that Kennecott removes ore from the mine pit, processes the ore elsewhere, and stores the tailings in an impoundment outside of the mine perimeter. Red Leaf is proposing to place the mined material back into the mine pit in a "capsule" configuration after sizing, sorting, and layering the overburden, interburden, and ore (e.g. oil shale).

I have studied the original and revised versions of the Red Leaf NOI. Revisions were made based on reviews of the application by DOGM. It is clear that Red Leaf has followed the established process within the state of Utah for permitting a large mine. This process, enacted by the Utah Legislature through its passage of the Utah Mined Land Reclamation Act in 1975, is intended to ensure that every permitted Utah LMO conforms to the same set of environmental standards with respect to surface and groundwater systems, soil resource conservation, slope stability, air quality, and reclamation among other things. The petitioning entity is required to post a bond that covers an estimate of reclamation and closure costs developed using DOGM operating costs and overhead.

The important issue is less the type of material that is being mined than the integrity of the process that grants the permits for LMOs. If the process is comprehensive and based on what has been learned from previous experience, then the environmental and safety risk of granting a new LMO permit is minimized. Given the broad scope of mining operations within the state, the experience of the DOGM staff in permitting LMOs, and the established procedures and standards that must be met before a permit is issued by DOGM, I conclude that DOGM is equipped to issue a permit for a mineral resource such as oil shale even though oil shale has not been mined on a

large scale in Utah for several decades.

The institute has several specific questions that we did not find answers to in the NOI. They are listed below in no particular order:

1. How is subsidence determined? If actual subsidence is significantly different than numbers given in the NOI, how will that impact the mine plan, revegetation, etc.? Will the capsule's seal be compromised? If the seal is compromised, how will it be detected and the effects of the break mitigated (see question 3)?
2. Three sources of water for the project are on-site impoundments, groundwater, and water extracted during the thermal processing of the oil shale. Will there be any monitoring of groundwater to ensure that impacts to groundwater are "non-existent" as stated in the NOI? What is the quality of the water recovered from thermal processing? Will it require any cleanup prior to use?
3. It is stated that the "bentonite-amended soil" (BAS) will provide a seal on the floor, walls, and roof of the capsule and that the hydraulic conductivity of the BAS layer will be 10^{-7} . What are the units associated with this hydraulic conductivity? Are they meters/day, centimeters/second, or something else? How will the impermeability of the BAS layer to both gases and liquids be tested? Does the BAS layer form a gas-tight seal? If not, are there VOC emissions from the capsule?
4. How long will reclamation continue if initial revegetation efforts are unsuccessful? As this area is very dry and the growing season is short, it could be very difficult to revegetate. Will the DOGM standard of at least 70 percent of the pre-mine vegetation cover be the standard that must be obtained before the bond is released?

If the above questions can be addressed more completely in the NOI and if the NOI meets the standards and requirements set by DOGM for permit approval, then I support the granting of an LMO permit to Red Leaf.